

AD-A146 104

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS  
COMMODORE FOODS COMP. (U) CORPS OF ENGINEERS WALTHAM  
MA NEW ENGLAND DIV MAY 79

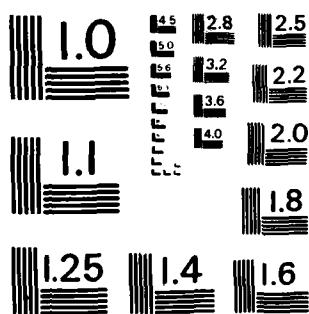
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MIDDLESEX COUNTY  
WESTFORD, MASSACHUSETTS

AD-A146 104

COMMODORE FOODS COMPANY DAM  
MA-00131

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NATIONAL DAM INSPECTION PROGRAM  
CORPS OF ENGINEERS

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER MA 00131	2. GOVT ACCESSION NO. A140104	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Commodore Foods Company Dam		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT
NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE May 1979
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 40
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		16a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY, Middlesex County Westford, Mass.		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) It has been found to have a "low" hazard potential. The Commodore Foods Company Dam is of stone masonry construction, approximately 76.5 ft. in length and 16 ft. in height, with a 40 ft. wide overflow spillway. The peak failure outflow is estimated to be 3,300 cfs.		

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24 May 1979  
File No. 4270

New England Division  
U.S. Army Corps of Engineers  
424 Trapelo Road  
Waltham, MA 02154

Attention: Mr. E.P. Gould, Project Manager

Subject: National Dam Inspection Program  
Contract No. DACW33-79-C-0018, Item 4

Gentlemen:

The Commodore Foods Company Dam, Identification No. MA 00131, has been found to have a "low" hazard potential, as a result of the site visit conducted on 8 March 1979. This finding was brought to the attention of your Mr. Gary James of Project Management on 12 March 1979. At his request, this brief letter report documenting the "low" hazard potential classification of the dam is submitted in lieu of a complete Phase I Investigation report.

The dam is located across Stony Brook, adjacent to a Commodore Foods Company building in Westford, Massachusetts, Middlesex County, as shown on the Location Map, page A-1. A copy of the most recent available state inspection report, dated 9 October 1973, is included herein, page B-1. The Commodore Foods Company Dam is of stone masonry construction, approximately 76.5 ft. in length and 16 ft. in height, with a 40 ft. wide overflow spillway. Former outlet works gates and a pipe to the left and right of the spillway are no longer operative.

A "Site Sketch Plan", page C-1, shows the general configuration of the project and the direction of view of six photographs taken of the dam, Brookside Road Bridge and Stony Brook on 8 March 1979, pages C-2 through C-4. Measurements made at the dam site on the same day are given on pages D-1 and D-2.

New England Division  
U.S. Army Corps of Engineers -2-

24 May 1979

Based on Corps of Engineers Guidelines for Estimating Dam Failure Hydrographs, and assuming that a failure would occur along 40 percent of the length of the dam structure, the peak failure outflow is estimated to be 3,300 cfs. The downstream channel capacity, as shown in the attached computations, page D-3 and D-4, is more than adequate for this flow, and no flooding of the channel banks is expected to occur. A preliminary flood impact analysis of the effect on a pond located about 1,500 ft. downstream of the Brookside Road Bridge shows that the maximum increase in water surface level of the pond following entry of the failure flood waters would be about 3 ft. No dwellings are expected to be flooded as a result of the dam failure.

Therefore, it is considered that the hazard potential at the Commodore Food Company Dam site is low. Because of this finding, the Phase I assessment of the condition of the dam was not completed.

Very truly yours,  
HALEY & ALDRICH, INC.



Peter L. LeCount  
Vice President

PLL/bms  
Enclosures

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Unannounced	<input type="checkbox"/>
Justification	
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A-1	

*A-1*

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FILE NO. 4270 A25

DAM: COMMODORE FOODS CO.  
IDENTIFICATION NO. MA 00131



LOCATION MAP  
USGS QUADRANGLE

WESTFORD, MA

APPROX. SCALE: 1" = 2000'

January 15, 1974

Stuart Haywood, Plant Manager  
Commodore Foods Company  
645 Lawrence Street  
Lowell, Massachusetts 01850

Re: Inspection-Dam A-9-330-2  
Westford  
Commodore Foods Co. Dam

Dear Mr. Haywood:

An engineer from the Massachusetts Department of Public Works has inspected the above dam, owned by the Commodore Foods Company.

The inspection was made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970.

The results of the inspection indicate that this dam is safe; however, the following conditions were noted that require attention:

1. The controls for the five foot drain pipes are broken and need to be repaired or replaced as necessary.
2. Remove the growth from the joints of the masonry wall and repoint as needed.
3. Replace the missing masonry stones.

We call these conditions to your attention now before they become serious and more expensive to correct.

Very truly yours,

*Fred C. Schwell*  
FRED C. SCHWELL  
Deputy Chief Engineer

X-29  
LEAD:MEY  
CC: G.P. Mistratta  
L. LaBelle

## INSPECTION REPORT - DAMS AND RESERVOIRS

(1.) Location: City/Town WESTFORD Dam No. 4-9-330-2Name of Dam COMMODORE FOODS CO. DAM Inspected by A.Z. PIZANI  
F.H. PARE  
Date of Inspection 10-9-'73(2) Owners: per: Associated ✓ Prev. Inspection 10-9-73Name of Roads None ✓ City/Town None State None Tel. No. None1. Name COMMODORE FOODS CO. St. & No. 645 LAWRENCE ST. Lowell, MASS. 01850 (459-2551)Name None St. & No. None City/Town None State None Tel. No. None2. Name None St. & No. None City/Town None State None Tel. No. None3. Name None St. & No. None City/Town None State None Tel. No. None(3) Caretaker (if any) e.g. superintendent, plant manager, appointed by  
absentee owner, appointed by multi owners.STU HEYWOOD, PLANT MGR, COMMODORE FOODS CO. 459-2551  
None, St. & No. City/Town State Tel. No.(4) No. of Pictures taken 3(5) Degree of Hazard: (if dam should fail completely)\*  
1. Minor None 2. Moderate ✓  
3. Severe None 4. Disastrous None

\*This rating may change as land use changes (future development)

(6) Outlet control: Automatic ✓ Manual NoneOperative Yes ✓ No. NoneIn case of THE None CONTROLS FOR THE 5' EMERGENCY

DRAIN PIPES ARE BROKEN, AND HAVE NOT BEEN REPAIRED

THE PIPE VALVES SHOULD BE REPAIRED (SEE NO. 12)

1. Spillway into the Dam: NoneCode ✓ Major Repairs None  
Major Repairs None Minor Repairs None

-2-

(8) Downstream Face of Dam: Condition: 1. Good  2. Minor Repairs   
3. Major Repairs  4. Urgent Repairs

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(9) Emergency Spillway: Condition: 1. Good  2. Minor Repairs   
3. Major Repairs  4. Urgent Repairs

Comments: SEE NO. 6

(10) Water level at time of inspection \_\_\_\_\_ ft. above 0.5' below \_\_\_\_\_  
top of dam  Principal spillway \_\_\_\_\_  
other \_\_\_\_\_

(11) Summary of Deficiencies Noted:

Growth (Trees and Brush) on Embankment  (SEE PICTURES)

Animal Burrows and Washouts \_\_\_\_\_

Damage to slopes or top of dam \_\_\_\_\_

Cracked or Damaged Masonry \_\_\_\_\_

Evidence of Seepage \_\_\_\_\_

Evidence of Piping \_\_\_\_\_

Erosion \_\_\_\_\_

Leaks \_\_\_\_\_

Trash and/or debris impeding flow \_\_\_\_\_

Clogged or Blocked spillway  \_\_\_\_\_

Other \_\_\_\_\_

(12) Remarks & Recommendations: (Fully Explain)

URGENT REPAIRS ARE NEEDED TO OPEN THE 5' DIAMETER PIPES, SO THAT HOMES DO NOT HAVE WATER IN CELLARS, UPSTREAM, WHEN WATER RISES TO HIGHER THAN DESIGNED ELEVATION.  
THE ~~\_\_\_\_\_~~ CONTROL IS RATCHET OPERATED.

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(13) Overall Condition:

1. Safe
2. Minor repairs needed
3. Conditionally safe - major repairs needed
4. Unsafe
5. Reservoir impoundment no longer exists (existing)  
Recommend removal from inspection list

DESCRIPTION OF DAM  
DISTRICT #4

Submitted by FRANCIS H. PARE & ADAM Z. PIZAN  
Date 10-4-73

Dam No. 4-9-330-2  
City/Town WESFORD  
Name of Dam COMMODORE FOUDS  
DAM

1. Location: Topo Sheet No. 75C  
Provide 8½" x 11" in clear copy of topo map with location of Dam  
Map indicator \_\_\_\_\_

2. Year built: UNKNOWN Year/s of subsequent repairs UNKNOWN

3. Purpose of Dam: Water Supply        Recreational         
Irrigation        Other       

4. Drainage Area: 3.5 SQ. Mi. 7,250 ACRES.

5. Normal Pending Area: 75 acres; Ave Depth 4'  
Impoundment: 100 MIL. gals; 300 acre ft.

6. No. and type of dwellings located adjacent to pond or reservoir  
i.e. summer homes etc. \_\_\_\_\_

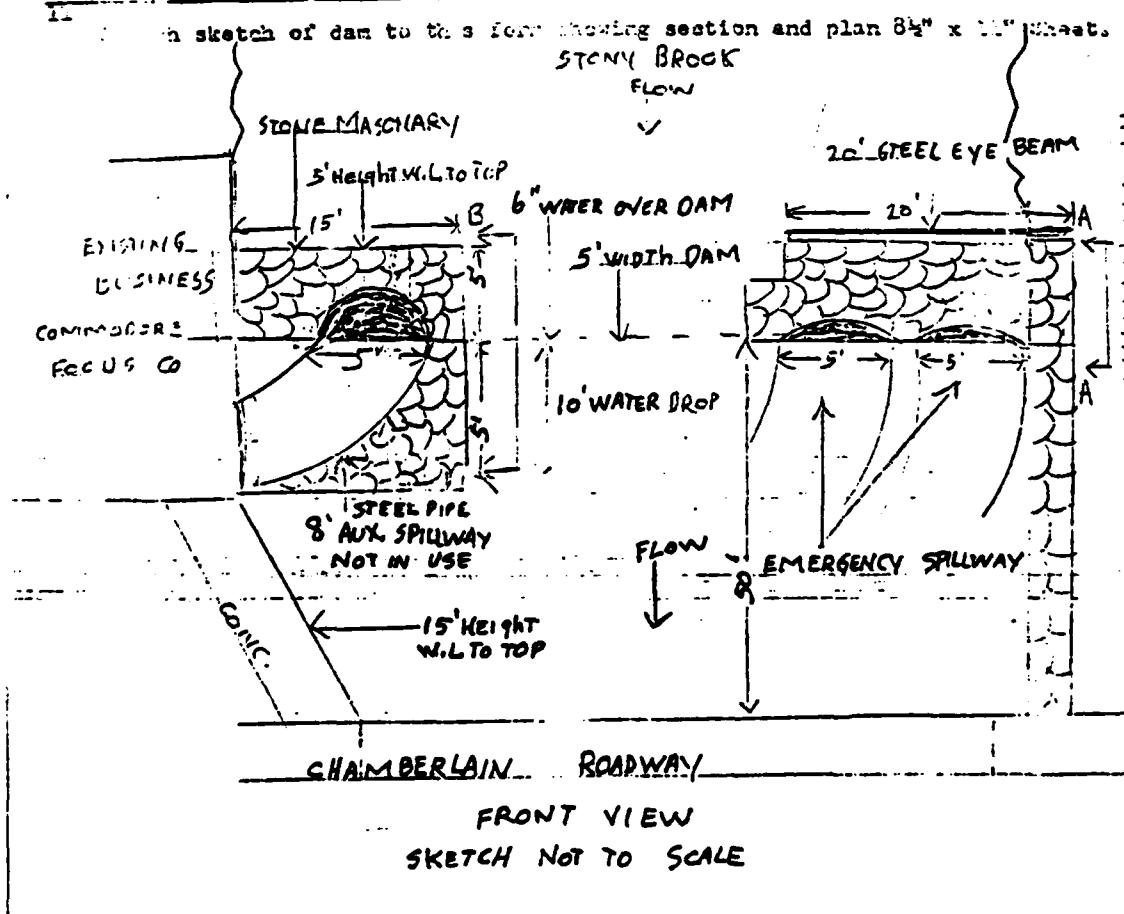
7. Dimensions of Dam: Length 25' Max. Height 5' Depth of Dam \_\_\_\_\_  
Slopes: Upstream Face 45°  
Downstream Face 45°  
Width across top 5'

8. Classification of Dam by Materials:  
Earth        Concrete Masonry        Stone Masonry         
Timber        Rockfill        Other       

9. A. Description of present land usage downstream of dam: 50% rural;  
20% urban  
B. Is there a storage area or flood plain downstream of dam which could  
accommodate the impoundment in the event of a complete dam failure  
No        Yes

DAM NO. 4-9-330-2

Risk to life and property in event of complete failure.  
No. of families \_\_\_\_\_  
No. of homes \_\_\_\_\_  
No. of businesses 1 BUSINESS, COMMODORE FOODS CO. ADJ. TO DAM  
No. of schools 1 NONE  
No. of utilities 11  
Railroads 1 OPERATING, ADJ. TO PLANT  
Other dams NONE  
Other \_\_\_\_\_

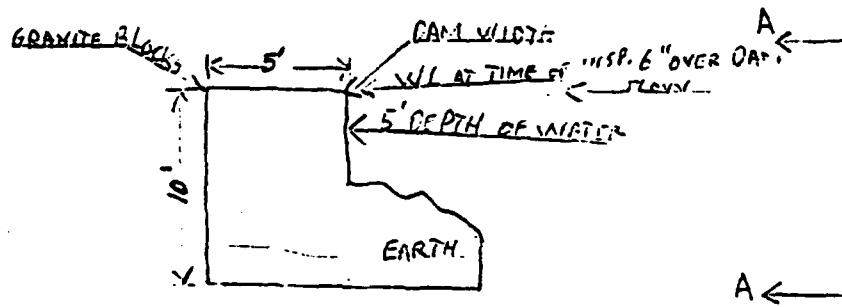


DAM NO. 4-9-330-2

10. Risk to life and property in event of complete failure.

No. of houses \_\_\_\_\_  
No. of homes \_\_\_\_\_  
No. of businesses \_\_\_\_\_  
No. of industries \_\_\_\_\_  
No. of utilities \_\_\_\_\_  
Railroads \_\_\_\_\_ OPERATING ADJ. TO PLANT B&M  
Other dams \_\_\_\_\_ None  
Other \_\_\_\_\_

11. Attach sketch of dam to this form showing section and plan 8 $\frac{1}{2}$ " x 11" Sheet.



X SECTION A  
SKETCH NOT TO SCALE

FILE NO. 4270 A36

NOTE

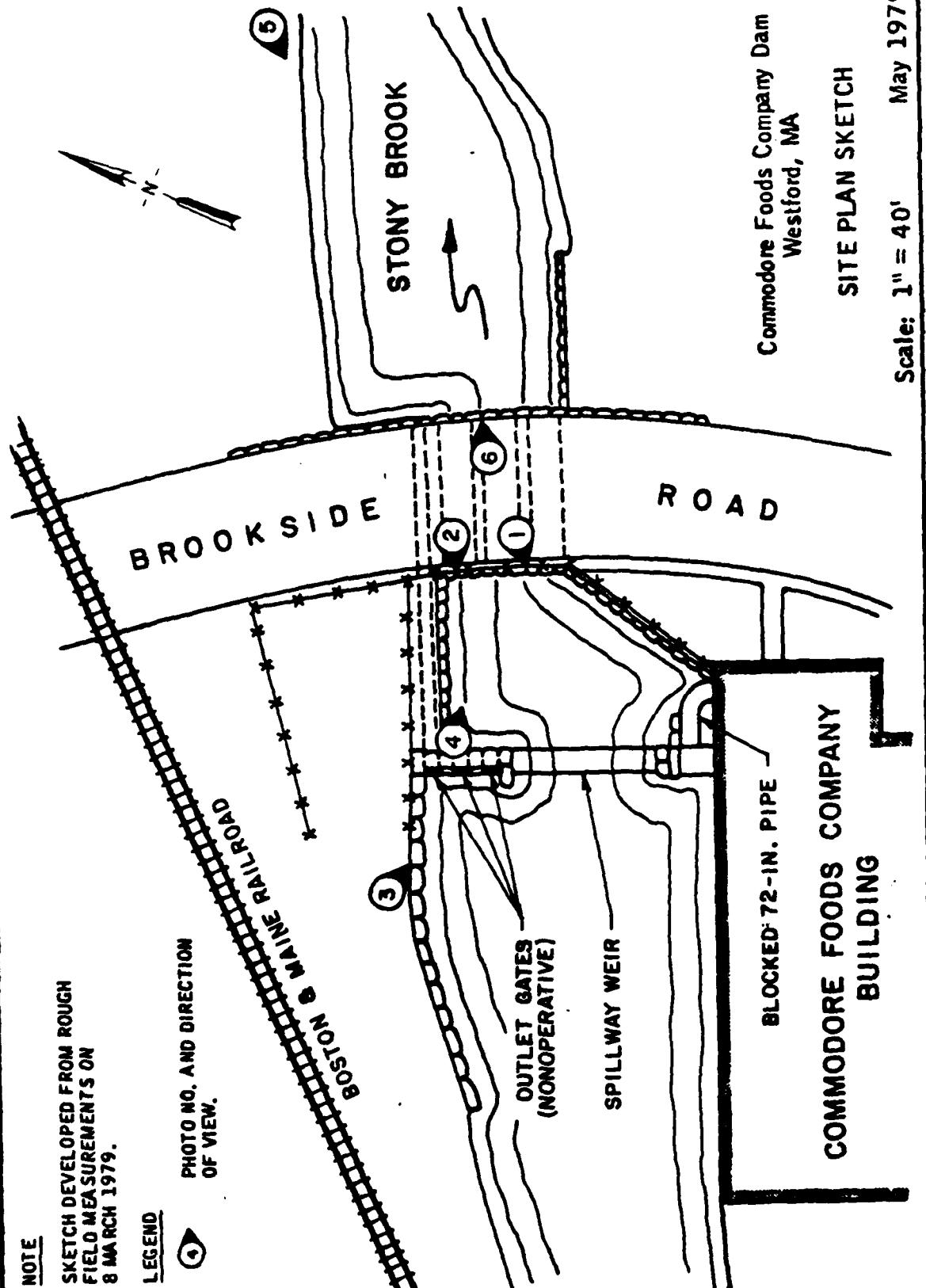
SKETCH DEVELOPED FROM ROUGH  
FIELD MEASUREMENTS ON  
8 MARCH 1979.

LEGEND

PHOTO NO. AND DIRECTION  
OF VIEW.



HALEY & ALDRICH, INC.  
CAMBRIDGE, MASSACHUSETTS



C-1

Commodore Foods Company Dam  
Westford, MA

SITE PLAN SKETCH

Scale: 1" = 40'  
May 1979



1. Overview of Commodore Foods Company Dam and  
Stony Brook upstream of dam



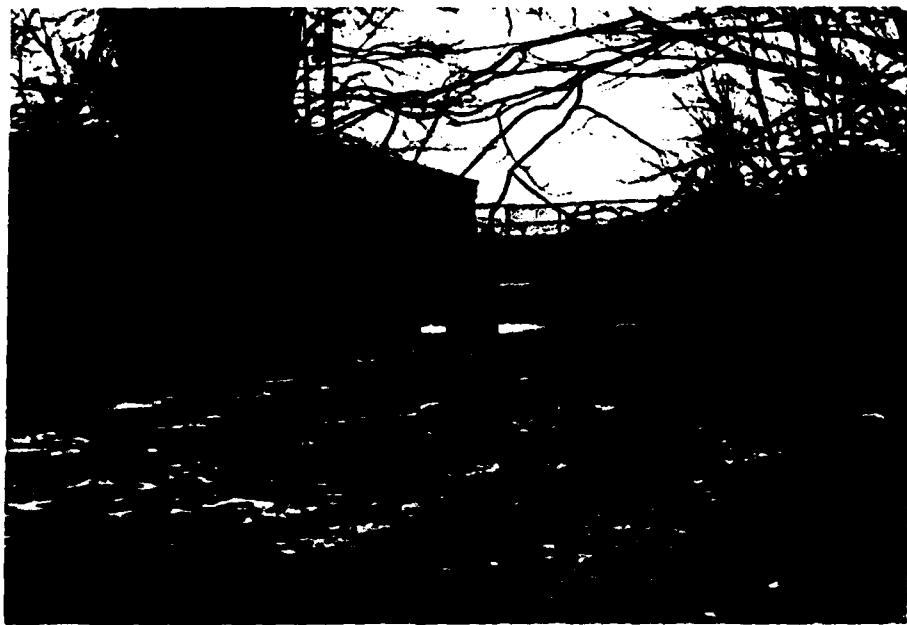
2. Left side of dam, showing two inoperative  
48-in. diameter outlets



3. Stems of three inoperative gates left of spillway



4. Upstream side of Brookside Road Bridge



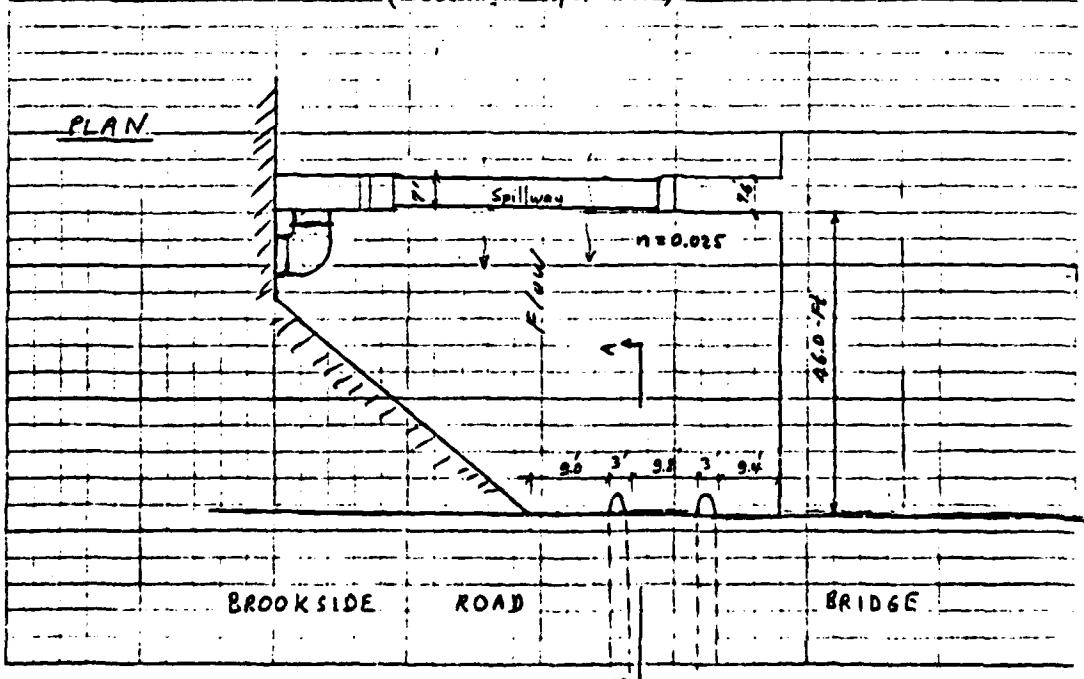
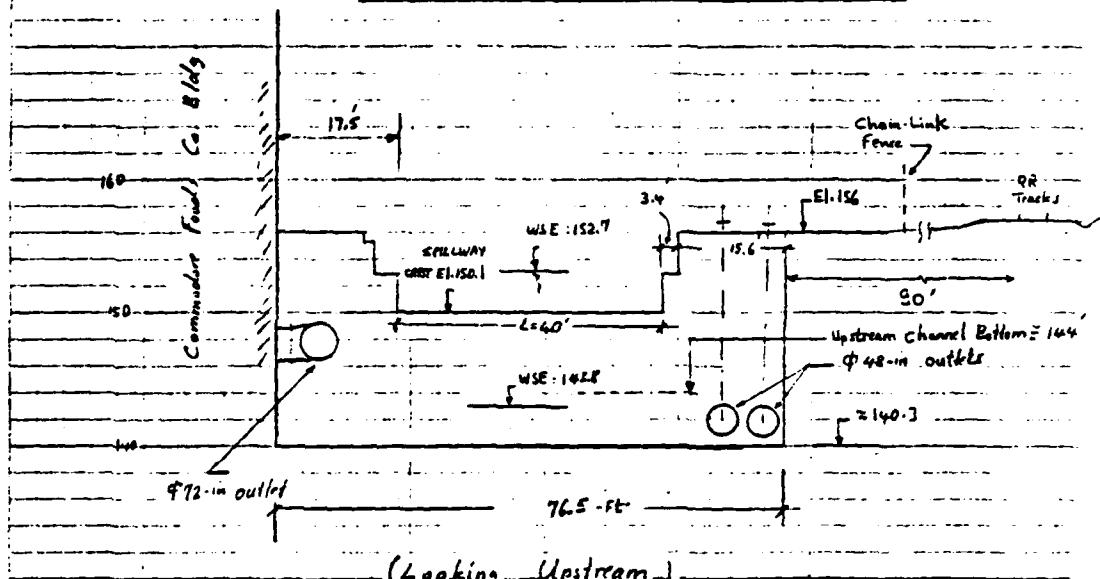
5. Downstream side of Brookside Road Bridge



6. Stony Brook channel downstream of Brookside Road

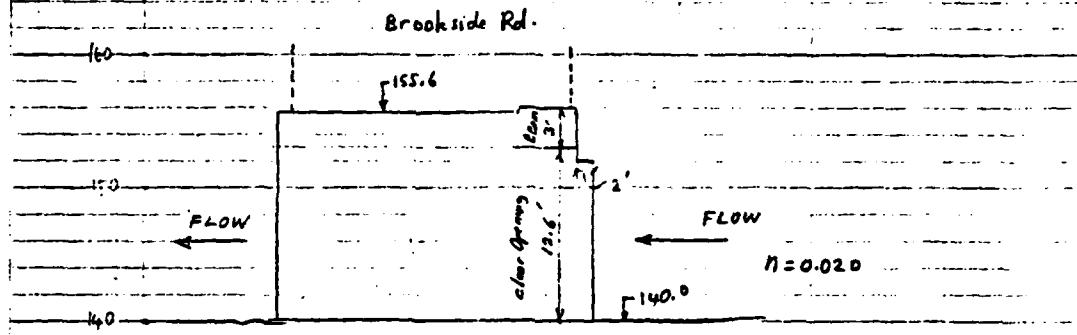
CAMP DRESSER & MCKEE CLIENT H-A JOB NO 561-9-PT-4 PAGE 3  
 Environmental Engineers DATE CHECKED 5/17/71 DATE 3/22/70  
 Boston, Mass. PROJECT SOL Dam Inspection CHECKED BY AHL  
 DETAIL Commander Front Cn. Dam COMPUTED BY AHL

SPILLWAY & DAM - FRONT ELEVATION

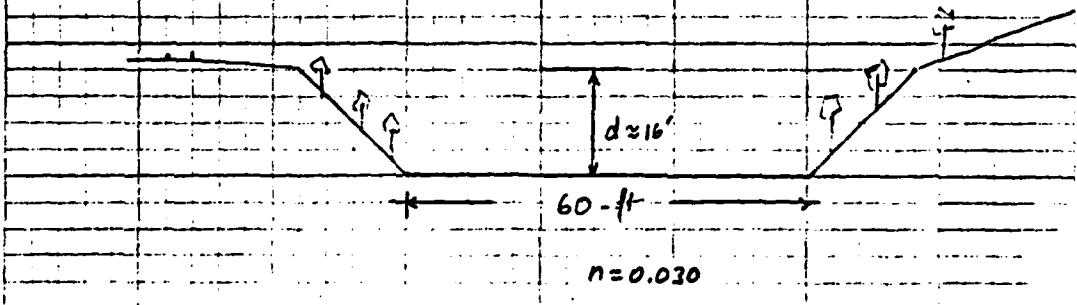


CAMP DRESSER & MCKEE CLIENT H & A JOB NO 561-9-RT-4 PAGE 4  
Environmental Engineers PROJECT CAF Dam Inspection DATE CHECKED   DATE 3/22/79  
Boston, Mass. DETAIL Commodore Funds Co. Dam CHECKED BY   COMPUTED BY BIL/

SECTION A-A @ BRIDGE



DOWNSTREAM CHANNEL SECTION : Below the Bridge



CAMP DRESSER & MCKEE CLIENT H+A JOB NO 561-9-R1-14 PAGE 1  
 Environmental Engineers PROJECT CCF Dam Inspection DATE CHECKED 5/17/79  
 Boston, Mass. DETAIL Commodore Feed' Cn'Dam CHECKED BY RMS DATE 3/21/79  
 COMPUTED BY AAC

Size Classification

Storage Volume : Normally no ponding exists behind the dam. (No ponding is shown upstream of the Commodore Foods Company dam on USGS map). The pond shown on the left bank, upstream of the dam, has no connection to Stony Brook; the WSE in Stony Brook, during the inspection, was about 4.2 feet lower than the level in the pond. The storage volume at the top of the dam was estimated from the USGS as follows:

$$V = \frac{3000 \cdot 4 \cdot 300 \cdot 41 \cdot 12\%}{43,560} = 124 \text{ ac-ft} \approx 1000 \text{ ac-ft}$$

Dam Height :  $H = 156.0 - 140.3 = 15.7 \approx 16 \text{ ft} \approx 40 \text{ ft}$ .

SIZE : SMALL

Hazard Potential : requires checking of downstream channel hydraulics for the dam failure flood:

$$Q_{p_1} = \frac{g}{27} \cdot 0.4 \cdot 76.5 \cdot 5.67 \cdot 16^{2/3} = 3,300 \text{ cfs.}$$

Channel Reach upstream of the bridge on Brookside Road:-

channel capacity :  $A = 10 \cdot 76.5 = 765 \text{ ft}^2 \quad R^{2/3} = 2.98 \quad n = 0.025$

$$(\text{see page 3}) \quad S = 0.005 \quad Q_{max} = \frac{1.49}{0.025} \cdot 765 \cdot 2.98 \cdot 0.07 = 12,700 \text{ cfs.}$$

Capacity of the Bridge openings :  $3 - 9.5 \times 12.6 \text{ (ft) openings}$   
 (see pages 3 or 4)

$$A_1 = 9.5 \times 12 = 114 \text{ ft}^2 \quad R_1^{2/3} = 2.28 \quad n = 0.02$$

$$S = 0.005 \quad \sqrt{S} = 0.07 \quad Q = \frac{1.49}{0.02} \cdot 114 \cdot 2.28 \cdot 0.07 \approx 1,350 \text{ cfs.}$$

$$2Q = 3 \cdot 1,350 = 4,050 \text{ cfs.}$$

CAMP DRESSER & MCKEE  
Environmental Engineers  
Boston, Mass.

CLIENT H & A PROJECT COE Dam Inspection DETAIL Commodore Fiske Can Dam

JOB NO 561-3-PA-4 DATE CHECKED 5/17/79 CHECKED BY RHS

PAGE 2 DATE 3/21/79 COMPUTED BY AVG

Downstream channel below the bridge: (See page 4)

$$\text{Flow Capacity: } A = 16 \times \frac{60+90}{2} = 1,200 \text{ ft}^2 \quad n = 0.03$$

$$R^{1/2} = 5.1 \quad S = \frac{143.3 - 140}{1500} = 0.0022$$

$$Q = \frac{1.93}{0.03} 1200 \times 5.1 \times 0.047 = 14,250 \text{ cfs}$$

Flow capacity of the downstream channel and the bridge is more than the failure flood flow of 3300 cfs, therefore no overtopping of the stream banks is expected.

Failure Flood Impact in the Pond between Brooksville and West Chelmsford:

Normal Pond Area  $\approx$  21 acres +  $\overbrace{10.3}^{\text{Swamps}} = 31.3$  acres

channel storage during the failure flood:  $80 \times \frac{16+8}{2} \times 1500 \times \frac{1}{43,560} = 33 \text{ ac-ft}$

Storage volume above the dam: 124 ac-ft (El. 156.0) (top of dam)

Net Flow into the downstream Pond:  $124 - 33 = 91 \text{ ac-ft}$

Assuming no outflow from the downstream pond:

$h_w = \frac{91}{31.3} = 2.9 \text{ ft}$  NSE is the downstream pond would rise by about 3.0 feet to El. 143.0

With exception of one plant building on the right bank near the outlet of the downstream pond, no dwellings can be seen below 150 contour on USGS map.

Conclusion: Hazard Potential is LOW

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